

Appendix E: Pretest Report

TO: Leslie Christovich

FROM: Brad Chaney/Kimberley Raue

SUBJECT: Pretest report

This memo presents the final results of the pretest of the Facilities Questionnaire.

Methodology

The general design was to have each question pretested by nine academic institutions and three or four biomedical institutions. However, because of the extensive effort required of some institutions to complete the survey, combined with the need to pretest the instrument over a relatively short time, most of the pretest institutions were recruited to complete a portion of the questionnaire rather than the full questionnaire. The section on cyberinfrastructure was still in development while the first 15 questions were being pretested, so it was pretested in a separate round. For this reason, though some institutions completed the full base section of the questionnaire, no institution completed both this and also the new section on cyberinfrastructure.¹

The questionnaire was divided into four sections: questions 1-6 on the amount and condition of research space, questions 7-10 on repairs, renovations, and new construction in the last 2 years, questions 11-15 on planned and deferred repairs, renovation, and new construction, and the new section on cyberinfrastructure.

Pretest institutions were chosen based on the following criteria: they were required to be past respondents of the survey from 1999 and 2001, and were selected to show diversity with respect to region, institution type, size, and research expenditures. Institutions with a Master's degree as the highest degree conferred and HBCUs were included as well. In addition, several institutions with medical schools were recruited to ensure that questions pertaining to medical school research space would also be pretested. The following table shows the characteristics of the institutions that agreed to participate in the pretest.

¹ The term "base section of the questionnaire" is used here to describe the questions that asked about building facilities (as in earlier survey years), as contrasted with the new questions that asked about cyberinfrastructure. The terms "cyberinfrastructure" and "computing and networking capacity" are treated here as interchangeably referring to the new section on cyberinfrastructure. However, the questionnaire content actually falls somewhat in the middle of these two categories, since it is somewhat broader than just capacity (e.g., it asks about institutional plans and computing speeds) but narrower than cyberinfrastructure (which could also include topics such as middleware and research databases).

Number of pretest institutions by institution characteristic

Institution characteristic	Questions answered in base questionnaire				Computing section
	All	1-6	7-10	11-15	
All institutions	7	5	5	5	13
Research expenditures					
Less than \$10,000	1	2	1	2	3
\$11,000 to 15,000	1	2	3	1	3
\$16,000 or more	2	1	1	2	3
Not available	3	0	0	0	4
Region					
Northeast	3	1	1	0	5
Central	0	1	1	1	0
South	2	1	2	3	2
West	2	2	1	1	6
Type					
Private academic	1	3	1	3	4
Public academic	3	2	4	2	5
Biomedical	3	0	0	0	4
Highest degree					
Doctorate	3	4	5	4	8
Master's	1	1	0	1	1
NA (biomedical)	3	0	0	0	4

Responses were received from 25 of 28 academic institutions and all 7 biomedical institutions.

To recruit the institutions for the pretest, institutional coordinators were called and told the purpose of the pretest. Coordinators who agreed to participate were sent a Federal Express package providing a full questionnaire, with the portions to be completed clearly indicated. Institutions were asked to fax back both the questionnaire and an accompanying commentary guide providing some initial comments about the questionnaire. The completed questionnaires and commentary guides were reviewed to identify what problems occurred when completing the questionnaires. The pretest respondents then were called to provide more detailed comments about the questionnaire (including some pre-established questions about known topics of interest), and to identify the reasons (and potential solutions) for any problems that occurred.

Level of burden

The amount of time required to complete the questionnaire varied greatly from one institution to another. Among the three academic institutions that completed the entire base questionnaire, the time ranged from 10 to 85 hours, with an average of 58.3 hours. Among the remaining academic institutions, the average amount of time required to complete each section was 14.8 hours for questions 1-6, 6.5 hours for questions 7-10, 3.6 hours for questions 11-15, and 0.8 hours for the section on cyberinfrastructure. If these results are combined in a weighted average based on the number of institutions responding, the estimated average time to complete the questionnaire is 38.9 hours.

Among biomedical institutions, the average time required to complete the questionnaire was 2.1 hours for questions 1-6, 0.9 hours for questions 7-10, 0.6 hours for questions 11-15, and 2.9 hours for the section on cyberinfrastructure, with an estimated total of 6.5 hours for the entire questionnaire.

The fact that institutions needed to agree to respond within 3 weeks may have resulted in excluding some institutions for which the questionnaire was highly burdensome. The division of the questionnaire into multiple sections may have helped to compensate for this problem, but the estimates here may still tend to underestimate the burden by excluding such institutions from the potential sample.

Confidentiality

Because NSF plans to make some or all of the facilities available as a public use data file, respondents were asked during the pretest interviews whether there were particular types of data that they did not want to be released. Each major section of the base questionnaire was listed, and institutions were asked for a yes/no response on each one. For institutions that completed only a portion of the questionnaire, only the questions that they completed were examined in this manner. No questions were asked about confidentiality on the cyberinfrastructure section; since it is entirely new, there is no past history to create an expectation of confidentiality for these questions.

Institutions were sometimes opposed to releasing certain types of data. Two institutions objected to releasing any data; one of these said it would make data available to institutions that asked for them, but that it wanted to avoid negative public input. As an example, it cited some graffiti that were put on a new biotech building. The other expressed a general reluctance to make data public without knowing how it would be used. Also, one institution felt it first would have to check with legal counsel before releasing any data. The most frequent objection was to releasing data about animal space, with 8 institutions saying that such data should not be released. Institutions expressed fear that protestors would use such data to target institutions for protest activities. Other topics that also were considered sensitive were the condition of the facilities (three institutions), the individual worksheets (one institution), the amount of space (one institution), and radiation facilities (one institution; radiation facilities are not specifically mentioned in the questionnaire on in the institution's responses, but the topic was considered sensitive following the terrorist attack on 9-11).

Problems in classifying research into fields

A few institutions had difficulties because their organizational structure did not match with the specified fields. For example, one institution placed computer sciences within mathematical sciences, based on their organizational structure. Another institution considers oceanography to be part of engineering rather than of life sciences. However, this did not affect the accuracy of its report; the particular questions that it answered did not require any data on oceanography, and the institution would have followed NSF's rules if it had answered question 2. More generally, the same institution expressed difficulties with splitting up dollar amounts for just one discipline, because it only knows awards by department. For space it has no clear way of dividing the space into disciplines, so it uses a percentage based on enrollment. Another institution also commented it had difficulty placing the departments within the specified fields, but did not give an example. A fourth was unsure where to place botany/plant science. [Note: the crosswalk places botany within the biological sciences, and plant science within the agricultural sciences.] A fifth was not sure if "medical" included veterinary medicine. [Note: there is an instruction concerning veterinary medicine in the crosswalk.] One person recommended referring to the crosswalk whenever the fields are listed, since many people don't read directions.

Other overall comments

One respondent said, “You should tell why you are asking the specific questions and what is the end product.”

One respondent wrote: “No one ever has enough space.”

The contrast between this questionnaire and the 2001 questionnaire was sometimes an issue. One institution commented: “Last year’s question was best. There were only 2 questions – how much space and the condition of the space.”

At least three institutions misunderstood the comprehensiveness of the survey. One of the largest institutions reported only on projects that had NSF funds when completing the base questionnaire, thus greatly understating the total amount of space. Since the same respondent completed the 2001 questionnaire, it seems likely the same mistake was made in 2001 as well. Even though this mistake reduced the amount of reporting that was required, it may have increased the level of effort because of the work involved in identifying which projects were associated with NSF, and prorating space that had some NSF involvement mixed with other research with no NSF involvement. Another institution sent the cyberinfrastructure questionnaire only to a single college within the institution because it thought that NSF was only interested in cyberinfrastructure with respect to the sciences.

One respondent disagreed with changing the order of the fields of science and engineering, saying that they were creatures of habit, and the change did not correspond with how they kept the data. She thought the order was more logical in 2001. (In the pretest version, they were ordered alphabetically.)

One institution requested that the survey be put online. [*Note:* For the pretest, only a hard copy version was used. An online version is planned for the actual survey.]

Comments on specific questions — base questionnaire

Question 1

One institution was uncertain whether it had data on research areas containing nonfixed equipment costing \$1 million or more.

One institution had never seen the term “core laboratory” and suggested adding a definition.

One institution commented that it has no information on equipment (1g) because that information is kept in a separate database. [*Note:* An implication is that equipment costs would be excluded elsewhere in the questionnaire.]

Question 2

Nine institutions commented that question 2 was the most difficult question. This question may have always been the most difficult, but the additional detail requested in question 2 required one institution to spend 15 hours reprogramming the software, and required another to perform some data manipulations after printing out the database. Another institution’s difficulty with question 2 was based more on the difficulty of classifying space within the specified S&E fields; however, this problem would

apply to the old questionnaire as well as the pretest version. The fourth institution had difficulty with the definitions, feeling the distinctions were not as straightforward as the definitions state. A fifth commented that she had to run the program one way for question 2 and another way for another part of the questionnaire, and that it gets especially complicated when there are multiple disciplines that have to be broken down using percentages. The percentages were calculated based on budgets, and there were 76 budgets across multiple disciplines. [Note: it seems that these calculations would be required in any case because the question has always asked for statistics by field. However, the extra breakdowns provide an additional layer for which the calculations must be performed. Also, many of the calculations were probably unnecessary because the respondent mistakenly thought she should only report on NSF funded research.] Of the institutions that commented on the difficulty created by the new categories, one commented that the change was an improvement because it would provide useful data because it would help the government to know where the labs and equipment are.

Question 2 also contained an ambiguity because it was not clear whether animal space should be counted only on the top line, or also within the specific S&E fields. Six institutions reported animal space in both locations and four said that it was listed only on top.²

Another probe on question 2 (and on similar questions, if respondents were not asked to complete question 2) asked whether the notation “sq. ft.” next to the boxes caused difficulty, since technically institutions were requested to report NASF rather than square feet. One coordinator thought that the person completing that section probably reported square feet rather than NASF. Another institution appeared to be confused by the notation. Three institutions reported that they put down the data that they had available, which for two of the institutions at least sometimes meant reporting gross square feet rather than NASF. One institution was not confused, but thought the labels should be changed for consistency.

The following other issues appeared with regard to question 2:

- One institution reported only the total within the field for one S&E field, without breaking it down by category, and within another field reported a total that was much larger than the sum of the parts. The reason in both cases was a lack of information in the database on how the space was used. This institution expected the information to become available when a new system is adopted.
- One institution reported on total space, not research space.
- One institution handled joint use of a room by applying the overall research percentage of the department.
- One institution said it only has timely data when completing the FACR proposal (which is completed every 3 or 4 years), and that it covers only major research areas (i.e., with over \$75,000 in research and generally excluding office-based research).
- One institution lacked data for accounting for space used by multiple departments because the data were forwarded to consultants.

² If institutions did not answer question 2 because they only completed part of the questionnaire, but reported animal space elsewhere, they were asked if the animal space was included in the listings by field of science. These answers are included here since they refer to the general design of question 2.

- One institution said the answers probably reflected square feet rather than NASF, and commented that 30 percent of the space is hallways and bathrooms.
- One institution omitted animal space, probably because the person completing that question was not aware of it. (The total amount is small — about 100 square feet.) The coordinator would not have thought of including it because it is not federally approved space.
- One institution omitted any response to the line for animal space because it did not know the breakdown for the use of the space (because the building had just been built).

Question 3

No problems.

Question 4

No problems.

Question 5

Several expressed the need for definitions. Several also expressed to the need to consult others because they did not have these data. One said that the requested information is excessive. Some said this was difficult to complete, though one institution said it was the easiest question on the questionnaire (though it did require a consultation with the Vice Chancellor of Veterinary Affairs). One institution was bothered that BL-1 animals were not included.

Question 6

One institution lacked time to complete it. Another said that the information was not readily available for all spaces. A third said the information would be easier to provide if it were requested by departments. It commented that it was difficult to evaluate shared space if, say, the physicist said the space was okay and the chemist did not. A fourth said the time period should be at least 3 years since most federal funding is for 3 to 5 year periods. A fifth said the answers were a guesstimate based on asking the facilities coordinator for each college within the institution, along with using data from a field in the database and also using information on construction and renovation. A sixth institution took a shortcut by creating an overall evaluation for all space within each field, rather than reporting the percentage in each category. The same institution also recommended changing a category to “renovation contemplated or planned,” and said that its evaluation of space was sometimes based more on the state of the equipment than of the physical space itself.

Question 7

At one institution two departments share the same building, and they did not have separate costs per department. The institution took the total amount for the building, and divided it evenly. Another institution expressed confusion over the instructions in question 7, wondering whether to include multiple projects that collectively summed to over \$100,000 or only those with \$100,000 per field per project.

One institution asked whether to include renovation of the infrastructure, such as bringing the building up to seismic codes, when only part of the space is devoted to research. They prorated the renovation based on the amount of space that was devoted to research.

Based on one institution's responses to question 10, it appears likely that at least some institutions are reporting only projects that are entirely devoted to repair/renovation, and not including the renovation components of projects that mixed repair/renovation with new construction.

One institution requested a definition of the phrase "building out shell space."

Question 8

The skip pattern mentioned in question 8 only applies to institutions that have performed repairs/renovations but not new construction. If they have performed neither repairs/renovations nor new construction, they should actually skip to question 11 rather than question 9.

One person was confused by the instruction "Please fill out one worksheet for each project," and would have placed multiple projects on a single worksheet.

Question W1

No problems.

Question W2

No problems.

Question W3

One institution was unable to provide the costs for new construction because the total project included both repair/renovation and new construction. Instead it gave the total cost.

Question W4

One institution was unable to provide the net assignable square feet for research because the space was not set up yet. It wrote "NA" as the response

As discussed with regard to question 7, it appears likely that at least some institutions are not reporting the repair/renovation components of projects mixing repair/renovation with new construction.

Question W5

No problems.

Question 9

Two institutions thought this applied only to worksheet data, and left off data reported in question 7

As noted on question W4, one institution was unable to split total funds between repairs/renovations and new construction.

One institution had difficulty because at the time of the survey it was uncertain of the funding source. The source depended on whether a bond issue would pass, and they did not know whether it would pass at the time of the survey.

One respondent said that institutions vary in how they classify funding, and that we should provide more examples (especially for “Other sources”). Some would place grants from private companies and individuals under “Other sources.” This institution commented that it reported no federal funds, despite that fact that most of the funds for research and research-related modeling originates from federal sources; instead, it classified the funding source as institutional funds because it comes from an institutional remodeling fund. All funds from the research overhead account for remodeling are considered institutional funds. This appears to be a correct decision, since the questionnaire groups the recovery of indirect costs with institutional funds.

Question 10

Only three institutions provided amounts, and only one was a nonzero amount. One institution left the item blank when the actual answer (provided in the telephone followup) was zero. One institution incorrectly checked that institutional funds are not a source for these projects, despite reporting institutional funds in question 9C. This same institution commented on having difficulty understanding the question, and not being sure whether it was answered correctly. One institution commented that for most institutions, indirect costs go into the general revenue for the institution, rather than earmarking it for any source. It also commented that indirect reimbursement for past expenses are not available for future projects (however, the question does not ask about future projects). One institution considered the question to be very confusing, and still had difficulty after reading it 10 times. For a few institutions, the question was not applicable (the institutions had no expenditures in the previous 2 years on either repair/renovation or new construction), but there was no appropriate skip pattern. This problem might be fixed if the skip instructions in question 8 are modified. Alternatively, the skip instructions within question 10 could be modified.

Question 11

One institution commented that there are no current plans for FY 2004, but that there may be such projects if funding becomes available.

Question 12

One institution said that new construction space is only available as gross square feet. If we want NASF, they will take an average, probably assuming that NASF is 69 percent of gross square feet.

Question 13

One institution had difficulty responding to this because the information is not kept by survey categories. It added: “I’m sure every institution tracks these differently. I don’t have the solution to this.”

Question 14

One institution was not clear what “institutional plan” meant. The coordinator of that institution did not have a problem with this terminology.

Question 15

No problems.

Crosswalk

See comments above about the fields of science. However, these comments are more about the difficulty of accommodating an institution’s organizational structure to the fields, rather than being problems with the definitions itself.

Other comments

One institution commented that the web form should provide links to particular pages, instead of forcing people to scroll through.

Questions on Computing and Networking Capacity (Cyberinfrastructure)

Person answering the questionnaire. One institution routed the survey to someone within an individual college at the institution rather than to the central office for information technology, under the assumption that NSF would be interested only in the sciences. This is a logical assumption, especially given that the base portion of the questionnaire is devoted only to the sciences, but a result was some of that institution’s responses reflected only part of the institution’s resources.

Even when an institution reported one primary respondent on the commentary guide, the pretest interviews showed that the primary respondent would generally consult with other individuals on certain questions. One respondent said that he expected that typically the survey would have to be completed by multiple people, but he considered the survey to be routine and easy.

Six respondents noted that the Chief Information Officer (or Director of Computing, depending on what the institution calls the position) is the best person to receive the survey because he/she will know who on the staff has the most knowledge to answer these questions. However, one respondent noted that the CIO may not know the answers to the questions and suggested the survey may not get delegated as it should.

Comments on specific questions

Question 1. The instruction to exclude DSL connections was too comprehensive because some types of DSL connections are quite fast.

Two institutions commented that responses may overstate institutions’ capacity because they may buy a high speed line (e.g., T3), but only subscribe to a fraction of that (e.g., a fractional circuit) through

their ISP. One respondent described it as a distinction between the “type of connection” and the “subscribed bandwidth.” This creates a distinction between the physical infrastructure (e.g., the T3 line) and the current capacity; they would need to pay a higher fee to their ISP to increase their capacity, but they would not need to change the physical infrastructure.

Note also that some institutions have asymmetrical connections, with download speeds being higher than upload speeds. This raises a question as to which speed is the most appropriate. NSF is probably most interested in the download speed, both because it is higher (and NSF is looking at maximum capacity) and because speed is probably more critical for downloads than uploads (i.e., relatively few institutions would have large databases to share, but many might want to make use of large databases available at a few locations). Probably this is what people would report, but NSF could add a clarifying instruction such as: “If your institution has an asymmetrical connection, please report on the download speed.” On the other hand, it may be that the real finding is that there is such a diversity of possible approaches that the questionnaire cannot possibly cover all of them, in which case the survey needs to rely on people using the “Other” category appropriately. Most likely, people would either report the (faster) download speed, or note the asymmetrical connection using the “Other” category, so the survey should collect accurate data even without any changes.

Questions 1 and 2 were generally described as easy, although one respondent mentioned a difficulty distinguishing between backbone and LAN connections, and another said that information for question 1 was not easily obtainable.

Question 3. One respondent wrote in 0 as the response, explaining that he is not responsible for LANs and that their 17,000 computers connect to the backbone. While there may be some LANs at the institution, he is not aware of them. Another institution did not provide a response for this question. The respondent explained that they do not have smaller LANs. While the main network is large, they connect through the medical center.

A third respondent wrote that the number of LANs is difficult to measure because a LAN could be a switch, a hub, or a combination (stack). [Technically, switches and hubs should be considered part of the backbone, rather than being considered as LANs themselves, but the definition provided in the questionnaire is vague and could be considered to include them.] The respondent for this institution said that the example, “such as a building” was also problematic because a LAN cannot necessarily be equated with a building; rather, it could be smaller. A fourth institution described having difficulty with the distinction between the backbone in question 2 and the LAN connection in question 3. The respondent was unsure how to count backbone segments because all networking from the wall plate to the Internet is provided centrally. He was also unsure whether the number of LANs was the number of VLANs (virtual local area networks), the number of buildings, or something else. A fifth institution also expressed the need for a more specific definition of LAN, saying the current definition could include VLANs, SLANs (secure local area networks), or other LANs.

Of the two institutions asked about this new definition, one said that it was more helpful, while the other said it would not have mattered.

Question 4. There were few comments with respect to question 4. At least at one institution, this information is kept only at the college level, so that it would need to be aggregated across colleges to produce statistics for the entire institution. This question therefore may often be more difficult to answer than the previous questions. One respondent described this question, in addition to question 3, as “subject

to interpretation,” while another respondent explained that his institution’s inventory does not have the speed of all network cards listed and as a result, he approximated his answer.

Question 5. One institution crossed out megabits, and wrote in “Gig” (so the answer would be 1 gigabit/sec.). This is easy to interpret, but crossouts would not be allowed on the web version. The respondent should instead write 1,000 megabits/sec as did the two other institutions reporting a 1 gigabit/sec. connection.

One institution felt the question should explicitly address the maximum speed on campus *via the backbone*. If the question had explicitly asked for this, the respondent would have answered 10 megabits/sec. However, they have self-contained labs (which they describe as LANs in parentheses) in which any one of forty computers can connect to any of the other forty at 100 megabits/sec. However, we are really interested in the combination of the backbone, local area networks, and desktop ports.

Question 6. One respondent based his answer of 155 megabits/sec on what they can achieve through their Internet2 connection because their system is configured to allocate resources this way. The respondent added that there is not a significant difference between commodity and Internet2 connections. Three institutions may have reported less capacity than would be expected based on their answers to questions 1-4; they were not questioned about this because the responses were not necessarily contradictory. Follow-up on this question was limited to institutions that appeared to over-report their capacity.

Question 7. No problems, although one institution noted that questions asking for percentages (as well as projections) are “guesstimates.”

Question 8. No problems.

Question 9. One respondent commented that 9e was tough because some are on a regular schedule and some are not. Probably every institution upgrades some applications but not others, given the wide number of applications in use. Institutions will probably answer “yes” if their policy is for at least some software to be upgraded.

No respondent answered item 9f.

Question 10. Three institutions wrote in 0 as the response, four institutions left question 10 blank, and three institutions provided a response, but each calculated the answer in a different way. Most respondents who entered a 0 or who left the question blank explained that they simply do not have computing capacity that can be measured in GFLOPS or if they do, no one knows where to find this information, although one respondent said he had someone who could answer the question, but it is unclear why no answer was written.

Of those respondents that provided an answer, one indicated in the telephone interview that he did not consider it to be either reliable or useful. (In fact, he purposely cut the theoretical speed by 50 percent — from 400 GFLPS to 200 GFLOPS — because he did not consider the theoretical speed to be achievable.). Another asked someone else, who estimated the answer to be .5 GFLOPS, but this was strictly a guess and the respondent suggested providing types of computers and their speeds as response options. Finally, the third respondent asked the institution’s Director of Systems Administration. He said

that their fastest machines are GS 160 Alpha Servers, which have six CPUs, each capable of 16 GFLOPS. He multiplied those together and gave the rounded answer of 100 GFLOPS.

The responses (and lack thereof) for this question suggest that the responses will have a low degree of reliability, and may also have such a low item response rate that the data should not be published and could not be reliably imputed.

One respondent who gave a precise answer suggested that instead of asking about peak performance, we should ask for more information about the system and its configuration.

Question 11. Four respondents reported having neither high performance computing on campus nor grid technology, while two respondents reporting having both. Two respondents reported having high performance computing, but not grid technology, and one respondent reported having grid technology, but not high performance computing. One respondent left this question blank, but in a telephone interview, reported having both.

No respondent expressed having a problem answering question 11. However, during the telephone interview, respondents were asked to describe how they interpreted “high performance computing” and “grid technology” and answers did not generally exhibit a clear understanding of the difference between 11a and 11b. While one respondent made the explicit distinction between a cluster of computers and grid technology, the other respondents did not. For example, one respondent described grid technology as the ability to co-op a large number of Pentiums together as worker ants to work together. Another respondent described it as any coordinated series of standard machines coordinated for analytical purposes. A third described it as computing power on demand.

One respondent indicated their plans for bringing grid technology to the institution, saying that they are planning to implement Globus Toolkit, which allows Grid Mode Video Conferencing and Collaborative Grid Computing.

Question 12. Though unauthorized use of wireless capabilities was a concern, it did not affect the responses of six of the seven institutions that were interviewed. It appears to be a separate issue rather than one that would affect question 12.

Question 13. Two institutions gave responses based on the whole institution, rather than on the area with wireless coverage.

Suggested new questions

1. One institution suggested asking if the institution has an Autonomous System (AS) number. A site with an AS number can peer with multiple ISPs, and tends to have the best and most reliable Internet access.

Survey of Science and Engineering Research Facilities

National Science Foundation National Institutes of Health

Please enter your identification number.

Identification Number

Your participation in this survey is voluntary. However, your institution's response is important because the information from this survey is used to provide a national, quantitative picture of the amount and condition of existing science and engineering research facilities at research-performing colleges, universities, and some biomedical research organizations.

Contact information

If you wish to comment on the burden of completing this survey, contact Suzanne H. Plimpton, Reports Clearance Officer, NSF, via email at splimpto@nsf.gov or call 703-306-1125.

Or, you may write the Office of Management and Budget, Paperwork Reduction Project (OMB Number 3145-0101), Washington, DC 20503.

If you have a question about the survey in general, please contact Dr. Leslie Christovich via e-mail at lchristo@nsf.gov or call 1-800-292-7782. If you have a question about a specific item in the survey, please contact xxxxxxxxxxxx at xxxxxxxx

Thank you for your participation.

Part 1: Science and Engineering Research Space

Definition of research space

When you answer this survey, please use the following definition of “**research space.**” Research space is the space used for the research activities of your institution that are separately budgeted and accounted for. These research activities can be funded by your own institution, the federal government, a state government, foundations, corporations, or other sources. Exclude research space used for departmental research that is not separately budgeted. The chart at the bottom of this page indicates the types of research space that should and should not be included for this survey.

Research space includes these types of areas:

- controlled-environment space, such as clean, cold, or white rooms
- technical support space (equipment areas, preparation areas, carpentry and machine shops, etc.)
- laboratories, including core laboratories that serve other laboratories
- laboratories and associated support areas used exclusively for animal research including procedure rooms, bench space, animal production colonies, holding rooms, germ-free rooms, surgical facilities, recovery rooms, etc.
- space for housing research animals and associated maintenance areas including cage rooms, stalls, wards, isolation rooms, exercise rooms, feed storage rooms, cage-washing rooms, shops, holding and storage areas, etc.
- offices, to the extent that they are used for research activities
- facilities containing fixed (built-in) equipment such as fume hoods
- space used for research containing nonfixed equipment costing \$1 million or more each (e.g., MRIs)
- leased space that is used for research
- research space in your medical school

Research space does *not* include:

- space that is designated as a Federally Funded Research and Development Center (FFRDC)
- in-kind space used by your faculty, staff, or other persons but administered by other organizations, such as research space at non-university hospitals or Veterans Administration hospitals
- space administered by your institution but leased to another organization
- libraries unless they are dedicated to a specific research project
- space used for the fields of law, business administration/management (except economics), humanities, history, the arts, or education (except educational psychology)
- animal field buildings sheltering animals that do not directly support research or that are not subject to government regulations concerning humane care and use of laboratory animals
- areas for treatment of animals that are veterinary patients

1. Please indicate whether or not your institution has each type of research space listed below.

Categories of research space	Have this type of research space? (Mark one "X" for each row.)		
	Yes	No	Uncertain
a. Laboratories, wet or dry, including computer laboratories, behavior observation laboratories, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Laboratory support space including autoclave rooms, darkrooms, equipment areas, storage areas for research equipment and supplies for research, etc.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Instructional laboratories that are also used for research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Core laboratories used for work that serves other laboratories	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Leased space used for research.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Offices used for research activities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Areas used for research containing nonfixed equipment costing \$1 million or more each (e.g., MRIs)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Research space in a medical school.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Central or departmental laboratory and support areas used exclusively for animal research that are subject to local, state, and federal government policies and regulations concerning humane care and use of animals (procedure rooms, holding rooms, recovery rooms, animal production colonies, storage areas, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Central or departmental housing and support areas used exclusively for research animals that are subject to local, state, and federal government policies and regulations concerning humane care and use of animals (animal quarters, cage washing rooms, feed storage areas, isolation rooms, exercise rooms, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Total science and engineering research space

Definition of net assignable square feet (NASF)

Net assignable square feet (NASF) is the sum of all areas (in square feet) on all floors of a building assigned to, or available to be assigned to, an occupant for a specific use, such as research or instruction. NASF is measured from the inside faces of walls.

Reporting research space that is shared

If science and engineering research space was used for other purposes in addition to research, report the portion of space used for research. For example, if an area was used for research half of the time and for other purposes the rest of the time, report half of the space as research space. Similarly, space might be shared for research by multiple disciplines. For example, if an area is used for physical sciences research one-fourth of the time, and three-fourths of the time it is used for biological sciences research, then report one-fourth of the space as physical sciences space, and three-fourths as biological sciences space.

Types of research areas

Four categories of research space are used in question 2. All of the different types of research space that you marked in question 1 should be included in one of these categories.

Laboratories	Areas with special-purpose equipment or configurations designed to meet the research needs of a particular discipline or a closely related group of disciplines
	Laboratories may involve work with electronics and large instruments with few piped services, or they may be equipped with a full range of piped services such as hot and cold water, gas lines, and compressed air. Laboratories may utilize benches, sinks, and fume hoods. Other types of laboratory space include core laboratories, computer laboratories, behavior observation laboratories, animal procedure rooms, etc.
Laboratory support space	Areas necessary to support research laboratories, such as autoclave rooms, darkrooms, equipment areas, and storage areas for research equipment and supplies
Offices	Offices of faculty, staff, and other persons, to the extent that they are used for research, including administrative activities for a specific research project
Other research space	All other space used for research

2. At the end of your FY 2002, how much space (NASF, or net assignable square feet) was used for **research** for each of the fields listed below? Please report NASF for each of the four types of space in the columns below. The total in the last column should equal the sum of the previous four columns. Provide estimates if you do not have exact figures.

If research space was shared among fields or used for other purposes in addition to research, report the portion of space used for research by each field below. For example, if two fields shared the space equally, report half of the space in one field and half in the other. Or, if an area was used for research one-fourth of the time and for other purposes the rest of the time, report one-fourth of the space as research space.

For animal space, include all departmental and central facilities that are subject to government and state policies and regulations concerning humane care and use of laboratory animals.

Net assignable space for types of research areas *

All animal space regardless of field of science	Animal laboratories and laboratory support	Animal housing and housing support only	Total animal space
	<input type="text"/> sq.ft.	<input type="text"/> sq. ft	<input type="text"/> sq.ft.

Field (see p. 18 for definitions)	Laboratories	Laboratory support space	Offices	Other research space	Total research space for this field
Agricultural sciences	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Biological sciences.....	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Computer sciences	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Earth, atmospheric, and ocean sciences	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Engineering	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Mathematical sciences	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Medical sciences	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Physical sciences.....	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Psychology	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Social sciences	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
Other sciences	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.	<input type="text"/> sq.ft.
(Please describe.)					

* This term is equivalent to functional category 2 (Research) for facilities inventory systems based on NCES, NACUBO, or WICHE classifications. For classifications, please refer to the Postsecondary Education Facilities Inventory and Classification Manual, U.S. Department of Education, Office of Educational Research and Improvement, NCES 92-165; the 1988 NACUBO Taxonomy of Functions; or the 1972 WICHE Program Classification Structure.

3. **If your institution has a medical school**, how much of your institution's research space (NASF) reported in question

2 is located in that medical school? (If none, enter "0.")

If you do not have a medical school,
check this box and go to question 4. ☐

Net assignable space for research (including animal space) at medical school ... sq. ft.

4. How much of your research space (NASF) is **leased** for science and engineering research. Please estimate if you do not have exact figures.

Net assignable space (including animal space) leased for research ... sq. ft.

5. Does your institution currently have the following types of specially adaptive animal facilities for research, or do you plan to have this type within 12 months?

Have this type of facility?
(Mark one "X" for each row.)

TYPE OF ANIMAL FACILITY	Currently have	Plan to have in 12 months	Will not have in 12 months
a. BL-2 fish research facility.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. BL-2 small animal research facility.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. BL-2 primate research facility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. BL-3 fish research facility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. BL-3 small animal research facility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. BL-3 primate research facility.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. BL-4 fish research facility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. BL-4 small animal research facility.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. BL-4 primate research facility	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Condition of research facilities

6. Please estimate the percentage of research space that falls into each of the categories below describing possible conditions of your science and engineering research space over the next 2 years. Please base these ratings on your current research program commitments including current faculty and staff or those to whom offers have been made, grants awarded, whether or not research has actually begun, **and** programs that have been approved. The percentages should sum to 100 within each row (field).

CONDITION CATEGORIES

SUPERIOR	Suitable for the most scientifically competitive research in this field over next 2 years
Satisfactory	Suitable for continued use over the next 2 years for most levels of research in this field, but may require minor repairs or renovation
Requires renovation	Will no longer be suitable for current research without undergoing major renovation within the next 2 years
Requires replacement	Should stop using space for current research use within next 2 years

Condition of space over next 2 years

Field	<i>Mark "X" if no research space in this field</i>	Superior	Satisfactory	Requires renovation	Requires replacement	Total
All animal space regardless of field of science	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Agricultural sciences	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Biological sciences	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Computer sciences.....	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Earth, atmospheric, and ocean sciences	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Engineering	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Mathematical sciences.....	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Medical sciences.....	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Physical sciences	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Psychology	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Social sciences.....	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%
Other sciences	<input type="checkbox"/>	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	<input type="text"/> %	100%

Part 2: Repairs, Renovation, and New Construction of Science and Engineering Research Space

Repairs and renovations started in FY 2001 and FY 2002

7. Please provide the total estimated completion costs of all repair or renovation projects of research facilities that started during your FY 2001 or FY 2002. Only include those projects that have completion costs estimated to be over \$100,000 for each field of science reported. For **multi-year projects**, report the entire completion cost even if some of the work will occur in future years. Consider the **start date** to be the date on which the physical work on the repairs or renovations actually began.

Repairs and renovations refer to activities such as fixing up facilities in deteriorated condition, capital improvements on facilities, and conversion of facilities. Do not report building additions and building out shell space as renovations since they are reported in this survey under new construction.

Completion costs include planning, site preparation, construction, fixed equipment, nonfixed equipment costing \$1 million or more each, and building infrastructure such as plumbing, lighting, air exchange, and safety systems either in the building or within 5 feet of the building foundation.

If research space will be shared: For repaired or renovated research space that will be shared by one or more fields, estimate the portion of the cost for each field. If space will be used for other purposes in addition to science and engineering research, estimate the costs for the research portion of the space. Report projects with shared costs only if costs are prorated at more than \$100,000 for at least one field. For example, if a \$180,000 project included equal space for two fields, this project of \$90,000 for each field would not be included. Or, if a \$160,000 project involved space used for research only one-fourth of the time, this project of \$40,000 for the research portion would not be included.

If you do **not** have any fields with repairs or renovations exceeding \$100,000, check this box and go to question 8. ☐

Field	Completion costs of repairs and renovations to research space over \$100,000
All animal space regardless of field of science	\$ <input type="text"/>
Agricultural sciences	\$ <input type="text"/>
Biological sciences	\$ <input type="text"/>
Computer sciences.....	\$ <input type="text"/>
Earth, atmospheric, and ocean sciences	\$ <input type="text"/>
Engineering	\$ <input type="text"/>
Mathematical sciences.....	\$ <input type="text"/>
Medical sciences	\$ <input type="text"/>
Physical sciences	\$ <input type="text"/>
Psychology	\$ <input type="text"/>
Social sciences.....	\$ <input type="text"/>
Other sciences	\$ <input type="text"/>

New construction started in FY 2001 and FY 2002

8. Please provide the total number of new construction projects for science and engineering research facilities at your institution that started during your FY 2001 or FY 2002. Only include those projects that have total completion costs estimated to be over \$100,000 for any field of science. Consider the **start date** to be the date on which the physical work of the construction actually began.

New construction refers to construction of a new building, additions to an existing building, or building out shell space.

Completion costs include planning, site preparation, construction, fixed equipment, nonfixed equipment costing \$1 million or more, and building infrastructure such as plumbing, lighting, air exchange, and safety systems either in the building or within 5 feet of the building foundation.

Report projects with **shared costs** only if costs are prorated at more than \$100,000 for at least one field. For example, if a \$180,000 project included equal space for two fields, this project of \$90,000 for each field would not be included. Or, if a \$200,000 project involves space used for research only one-fourth of the time, this project of \$50,000 for the research portion would not be included.

Number of new construction projects

If your institution has no projects that fit these criteria, please write zero and skip to question 9.

Please fill out one worksheet for each project that meets the criteria for this question. A single worksheet starts on the next page; if you need additional worksheets, feel free to copy this worksheet, to call NSF for additional worksheets, or to print additional worksheets from NSF's web site.

Please make additional copies of this worksheet as needed

Worksheet, Page 1 of 2

ID:

New Construction Projects
Costing over \$100,000
Started in FY 2001 or FY 2002

Please complete this worksheet for **each** new construction project that started in FY 2001 or FY 2002, **and** will have project completion costs estimated to be over \$100,000 for at least one field of science. Consider the **start date** to be the date on which the physical work of the repairs or renovation began.

1. What is the name of this project?
2. Is this project a building, an addition, or shell space that is being built out? (*Mark one "X."*)

Building ☐

Addition ☐

Building out shell space ☐

Other (*Please describe.*) ☐

3. When this project is complete, what do you estimate the **entire project's** completion costs and total gross square feet will be? Report **completion costs** for all years of the project. These costs include planning, site preparation, construction, fixed equipment, nonfixed equipment costing \$1 million or more each, and building infrastructure such as plumbing, lighting, air exchange, and safety systems either in the building or within 5 feet of the building foundation.

Estimated completion costs\$

Estimated gross space..... sq.ft.

Be sure to turn page over

Please make additional copies of this worksheet as needed

Worksheet, page 2 of 2
for new construction projects
costing over \$100,000

4. Please estimate this project's completion costs and the amount of space (NASF) for research for each field below.

Completion costs include planning, site preparation, construction, fixed equipment, non-fixed equipment each costing \$1 million or more, and building infrastructure such as plumbing, lighting, air exchange, and safety systems either in the building or within 5 feet of the building foundation.

If research space will be shared among fields or used for other purposes in addition to research, report the portion of cost and space used for research by each field below. For example, if two fields will share the space equally, report half of the space in one field and half in the other. Or, if an area was used for research one-fourth of the time and for other purposes the rest of the time, report one-fourth of the space as research space.

Field	Estimated completion costs over \$100,000 for research space	Net assignable space for research
All animal space regardless of field of science.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Agricultural sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Biological sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Computer sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Earth, atmospheric, and ocean sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Engineering.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Mathematical sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Medical sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Physical sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Psychology	\$ <input type="text"/>	<input type="text"/> sq. ft.
Social sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Other sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.

5. Which category below **best** describes the basis for each of your answers to question 4 for research costs and research space? (Mark one "X" for each column.)

	Estimated completion cost for entire project	Estimated gross space
Actual figure.....	<input type="checkbox"/>	<input type="checkbox"/>
Estimate/adjustment based on actual figures	<input type="checkbox"/>	<input type="checkbox"/>
Estimate based on personal knowledge	<input type="checkbox"/>	<input type="checkbox"/>
Other (please describe) <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sources of project funding, FY 2001 and FY 2002

9. Please provide the total estimated completion costs by source of funding for repair or renovation projects and new construction of science and engineering research facilities that cost over \$100,000, **and** started during your FY 2001 or FY 2002. Costs reported here should be consistent with the research costs reported in question 7 as well as the research costs reported on the worksheet(s) for new construction projects.

Consider the **start date** to be the date on which the physical work of the construction actually began. For **multi-year projects**, report the entire completion cost even if some of the work will occur in future years.

Repairs and renovations refer to activities such as fixing up facilities in deteriorated condition, capital improvements on facilities, and conversion of facilities.

New construction refers to the construction of new buildings, additions to existing buildings, and building out shell space.

Source of funding	Repairs and renovations over \$100,000	New construction over \$100,000
a. Federal government	\$ <input type="text"/>	\$ <input type="text"/>
b. State or local government	\$ <input type="text"/>	\$ <input type="text"/>
c. Institutional funds (your operating funds, endowments, private donations, tax-exempt bonds and other debt financing, indirect costs recovered from federal and other sources, etc.)	\$ <input type="text"/>	\$ <input type="text"/>
d. Other sources	\$ <input type="text"/>	\$ <input type="text"/>
(Please list)		
<input type="text"/>		
Total	\$ <input type="text"/>	\$ <input type="text"/>

10. What is the amount of indirect costs recovered from **federal** grants and/or contracts that is included in the "institutional funds" amount listed in question 9, Row c, for repairs and renovations, and new construction?

If institutional funds are not a source of funds for these projects, please check here and skip to the next question..... ☐

If you are not able to identify these amounts, please check here and skip to the next question..... ☐

	Repairs and renovations over \$100,000	New construction over \$100,000
Indirect costs recovered from federal grants/contracts	\$ <input type="text"/>	\$ <input type="text"/>

Planned repairs and renovations in FY 2003 and FY 2004

11. Please estimate the completion costs and space (NASF) for repair or renovation projects of science and engineering research facilities that will start during your FY 2003 or FY 2004 **and** will cost over \$100,000 for each field of science reported. Consider the **start date** to be the date on which the physical work on the repairs or renovations is scheduled to begin.

Repairs and renovations refer to activities such as fixing up facilities in deteriorated condition, capital improvements on facilities, and conversion of facilities. Do not report building additions and building out shell space as renovations since they are reported in this survey under new construction.

Completion costs include planning, site preparation, construction, fixed equipment, nonfixed equipment costing \$1 million or more each, and building infrastructure such as plumbing, lighting, air exchange, and safety systems either in the building or within 5 feet of the building foundation.

If research space will be shared: For repaired or renovated research space that will be shared by one or more fields, estimate the portion of the cost for each field. If space will be used for other purposes in addition to science and engineering research, estimate the costs for the research portion of the space. Report projects with shared costs only if costs are prorated at more than \$100,000 for at least one field. For example, if a \$180,000 project will include equal space for two fields, this project of \$90,000 for each field would not be included. Or, if a \$160,000 project will involve space used for research only one-fourth of the time, this project of \$40,000 for the research portion would not be included.

If you do not have any fields with repairs or renovations

exceeding \$100,000, check this box and go to question 12. ☐

Field	Planned repairs and renovations of research space	
	Estimated completion costs over \$100,000	Estimated net assignable space
All animal space regardless of field of science.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Agricultural sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Biological sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Computer sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Earth, atmospheric, and ocean sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Engineering.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Mathematical sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Medical sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Physical sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Psychology.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Social sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Other sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.

Planned new construction in FY 2003 and FY 2004

12. Please estimate the completion costs and space (NASF) for any planned new construction of science and engineering research facilities that is funded and scheduled to start in your FY 2003 or FY 2004 **and** will cost over \$100,000 for each field of science reported. Consider the **start date** to be the date on which the physical work of the construction is scheduled to begin.

New construction refers to construction of new buildings, additions to an existing building, or building out shell space.

Completion costs include planning, site preparation, construction, fixed equipment, nonfixed equipment costing \$1 million or more each, and building infrastructure such as plumbing, lighting, air exchange, and safety systems either in the building or within 5 feet of the building foundation.

If research space will be shared: For new research space that will be shared by one or more fields, estimate the portion of the cost for each field. If space will be used for other purposes in addition to science and engineering research, estimate the costs for the research portion of the space. Report projects with shared costs only if costs are prorated at more than \$100,000 for at least one field. For example, if a \$180,000 project will include equal space for two fields, this project of \$90,000 for each field would not be included. Or, if a \$160,000 project will involve space used for research only one-fourth of the time, this project of \$40,000 for the research portion would not be included.

If your institution has not funded and scheduled any new construction projects meeting these conditions,

check this box and go to question 13..... ☐

Planned new construction for research space scheduled to start FY 2003 or FY 2004 (new buildings, additions, and building out shell space)

Field	Estimated cost	Estimated net assignable space
All animal space regardless of field of science.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Agricultural sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Biological sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Computer sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Earth, atmospheric, and ocean sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Engineering.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Mathematical sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Medical sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Physical sciences.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Psychology.....	\$ <input type="text"/>	<input type="text"/> sq. ft.
Social sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.
Other sciences	\$ <input type="text"/>	<input type="text"/> sq. ft.

Deferred repairs and renovations

13. Please provide the estimated costs of any **deferred projects** for repair/renovation of science and engineering research facilities that are needed for current research program commitments, not yet funded, **and** not yet scheduled for FY 2003 or FY 2004. Please estimate costs separately for projects included in your approved institutional plan and projects not included in this institutional plan. Your institutional plan should include goals, strategies, and budgets for fulfilling your institution's mission during a specific time period.

Deferred projects are those that are necessary to meet your current research program commitments, are not funded, and are not scheduled for FY 2003 or FY 2004. Do not include projects planned for developing new programs or expanding your faculty.

Current research program commitments include current faculty and staff or those to whom offers have been made, grants awarded, whether or not research has actually begun, and programs that have been approved.

Repairs and renovations refer to activities such as fixing up facilities in deteriorated condition, capital improvements on facilities, and conversion of facilities. Do not report building additions and building out shell space as renovations since they are reported under new construction in question 14.

If research space will be shared: For repaired or renovated space that will be shared by one or more fields, estimate the portion of the cost for each field. If space will be used for other purposes in addition to science and engineering research, estimate the costs for the research portion of the space.

If your institution does *not* have any deferred projects
for repairs or renovation of science and engineering research

facilities, check this box and go to question 14..... ☐

Estimated costs for deferred repairs and renovations
(fixing up facilities in deteriorated condition, capital improvements on facilities, and conversion of facilities; does not include new construction)

Field	For projects included in your institutional plan	For projects <i>not</i> included in your institutional plan
All animal space regardless of field of science.....	\$ <input type="text"/>	\$ <input type="text"/>
Agricultural sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Biological sciences	\$ <input type="text"/>	\$ <input type="text"/>
Computer sciences	\$ <input type="text"/>	\$ <input type="text"/>
Earth, atmospheric, and ocean sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Engineering.....	\$ <input type="text"/>	\$ <input type="text"/>
Mathematical sciences	\$ <input type="text"/>	\$ <input type="text"/>
Medical sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Physical sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Psychology.....	\$ <input type="text"/>	\$ <input type="text"/>
Social sciences	\$ <input type="text"/>	\$ <input type="text"/>
Other sciences	\$ <input type="text"/>	\$ <input type="text"/>

Deferred new construction

14. Please provide the estimated costs of any deferred projects for **new construction** of science and engineering research facilities that are needed for current program commitments, not yet funded, **and** not yet scheduled for FY 2003 or FY 2004. Please estimate costs separately for projects included in your institutional plan, and projects not included in this institutional plan. Your institutional plan should include goals, strategies, and budgets for fulfilling your institution's mission during a specific time period.

Deferred projects are those that are necessary to meet your current research program commitments, are not funded, and are not scheduled for FY 2003 or FY 2004. Do not include projects planned for developing new programs or expanding your faculty.

Current research program commitments include current faculty and staff or those to whom offers have been made, grants awarded, whether or not research has actually begun, and programs which have been approved.

If research space will be shared: For new space that will be shared by one or more fields, estimate the portion of the cost for each field. If space will be used for other purposes in addition to science and engineering research, estimate the costs for the research portion of the space.

If your institution does *not* have any deferred projects

for science and engineering research facilities that involve new construction of buildings, additions to buildings, or

building out shell space, check this box and go to question 15..... ☐

Estimated costs of deferred new construction (new buildings, additions, building out shell space)

Field	For projects included in your institutional plan	For projects <i>not</i> included in your institutional plan
All animal space regardless of field of science	\$ <input type="text"/>	\$ <input type="text"/>
Agricultural sciences	\$ <input type="text"/>	\$ <input type="text"/>
Biological sciences	\$ <input type="text"/>	\$ <input type="text"/>
Computer sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Earth, atmospheric, and ocean sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Engineering	\$ <input type="text"/>	\$ <input type="text"/>
Mathematical sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Medical sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Physical sciences	\$ <input type="text"/>	\$ <input type="text"/>
Psychology	\$ <input type="text"/>	\$ <input type="text"/>
Social sciences.....	\$ <input type="text"/>	\$ <input type="text"/>
Other sciences.....	\$ <input type="text"/>	\$ <input type="text"/>

15. *If your institution has a medical school*, how much of your institution's cost estimates for deferred projects reported in question 13 and question 14 are for research space located in your medical school? (If none, enter "0.")

If you do not have a medical school, check this box and go to the next question..... ☐

**Estimated costs of deferred projects
for your medical school**

	For projects included in your institutional plan	For projects <i>not</i> included in your institutional plan
Repairs and renovation reported in question 13	\$ <input type="text"/>	\$ <input type="text"/>
New construction reported in question 14	\$ <input type="text"/>	\$ <input type="text"/>

**Crosswalk between NSF fields of science and engineering and the National Center for Education
Statistics (NCES) classification of instructional programs**

NSF field		NCES classification and additional examples of disciplines				
Agricultural sciences (except agricultural engineering and agricultural economics)	01.03	Agricultural production	03	Renewable natural resources	Agronomy	
	01.0303	Aquaculture	04.06	Landscape architecture	Animal science	
	01.07	International agriculture	Additional examples: Agricultural chemistry Agricultural economics—see Social sciences, Economics Agricultural engineering—see Engineering		Conservation	
	02.01	Agricultural sciences			Fish and wildlife	
	02.04	Plant sciences			Forestry	
	02.05	Soil science			Horticulture	
Biological sciences	19.05	Foods and nutrition studies	26.0701	Zoology	51.1313 Medical physiology	
	26.01	Biology, general	26.0702	Entomology	51.1314 Medical toxicology	
	26.0202	Biochemistry	26.0704	Pathology, human and animal	51.2203 Epidemiology	
	26.0203	Biophysics	26.0705	Pharmacology, human and animal	Additional examples: Allergies and immunology Biogeography Biotechnology	
	26.03	Botany	26.0706	Physiology, human and animal		Pathology
	26.04	Cell and molecular biology	26.0799	Zoology, other		Physical anthropology
	26.05	Microbiology/Bacteriology	26.99	Biological/Life sciences, other		Virology
	26.0601	Anatomy	51.1301	Medical anatomy		
	26.0603	Ecology	51.1302	Medical biochemistry		
	26.0609	Nutritional sciences	51.1307	Medical immunology		
	26.0610	Parasitology	51.1308	Medical microbiology		
	26.0612	Toxicology	51.1312	Medical pathology		
	26.0613	Genetics, plant and animal				
	26.0614	Biometrics				
	26.0615	Biostatistics				
	26.0699	Miscellaneous biological specializations, other				
	Computer sciences	11	Computer and information science, general			
		52.1201	Management information systems			
		Additional examples: Design, development, and application of computer capabilities to data storage and manipulation Information sciences				
		Earth, atmospheric, and ocean sciences	Atmospheric		Extraterrestrial atmospheres	
40.04	Atmospheric sciences and meteorology		Solar			
Additional examples: Aeronomy			Weather modification			

NSF field	NCES classification and additional examples of disciplines	
	Earth Sciences 15.1102 Surveying 40.06 Geological and related sciences 40.0703 Earth and planetary sciences 45.0702 Cartography	Additional examples: Engineering geophysics General geology Geodesy and gravity Geomagnetism Hydrology Inorganic Isotopic Lab geophysics Organic geochemistry Paleomagnetism Paleontology Physical geography Seismology
	Oceanography 26.0607 Marine/Aquatic biology 40.0702 Oceanography	Additional examples: Biological Chemical Geological Physical
	Other earth, atmospheric, and ocean sciences Multidisciplinary projects within earth, atmospheric, and ocean sciences	
Engineering	Aeronautical & astronautical 14.02 Aerospace, aeronautical, and astronautical engineering	Additional examples: Aerodynamics Space technology
	Bioengineering/Biomedical engineering 14.05 Bioengineering and biomedical engineering	
	Chemical 03.0509 Wood science 14.07 Chemical engineering 14.25 Petroleum engineering 14.32 Polymer/Plastics engineering	Additional examples: Petroleum refining process
	Civil 04.02 Architecture 14.04 Architectural engineering 14.08 Civil engineering 14.14 Environmental/Environmental health engineering	Additional examples: Geotechnical Hydraulic Hydrologic Sanitary and environmental Structural Transportation
	Electrical 14.09 Computer engineering 14.10 Electrical, electronics, and communications engineering	Additional examples: Power engineering
	Mechanical 14.11 Engineering mechanics 14.19 Mechanical engineering	

NSF field		NCES classification and additional examples of disciplines		
	Metallurgical & materials 14.06 Ceramic sciences and engineering 14.15 Geological engineering 14.16 Geophysical engineering 14.18 Materials engineering 14.20 Metallurgical engineering 14.21 Mining and mineral engineering		14.28 Textile sciences and engineering 14.31 Materials science 40.0701 Metallurgy	Additional examples: Welding
	Other engineering 14.01 Engineering, general 14.03 Agricultural engineering 14.12 Engineering physics 14.13 Engineering science 14.17 Industrial/Manufacturing engineering 14.22 Naval architecture and marine engineering 14.23 Nuclear engineering 14.24 Ocean engineering		14.27 Systems engineering 14.29 Engineering design 14.30 Engineering/Industrial management 14.99 Engineering, other 30.06 Systems science and theory	Additional examples: Marine and ocean engineering systems
Mathematical sciences	27.01 Mathematics, general 27.03 Applied mathematics 27.0302 Operations research 27.05 Mathematical statistics 27.99 Mathematics, other 30.08 Mathematics and computer sciences		Additional examples: Algebra Analysis Foundations and logic Geometry Numerical analysis Topology	
Medical sciences (exclude all residency programs)	26.0608 Neurosciences 26.0611 Radiation biology/ Radiobiology 30.11 Gerontology 51.02 Communication disorders sciences and services 51.04 Dentistry 51.07 Health and medical administrative services 51.10 Health and medical laboratory technologies 51.1201 Medicine, general 51.1399 Medical basic sciences, other 51.16 Nursing technologies 51.1610 Nursing Psychiatry/Mental Health 51.17 Optometry 51.19 Osteopathic medicine 51.20 Pharmacy 51.21 Podiatry	51.22 Public health 51.2306 Occupational therapy 51.2308 Physical therapy 51.2399 Rehabilitation/ Therapeutic services 51.24 Veterinary medicine 51.99 Health professions & related services, other	Neurological surgery Neurology Nuclear medicine Nuclear radiology Obstetrics and gynecology Oncology Ophthalmology Orthopedics/Orthopedic surgery Otorhinolaryngology Pediatrics Pharmacology Physical and rehabilitative medicine Plastic surgery Preventive medicine Psychiatry Thoracic surgery Urology	Additional examples: Anesthesiology Cardiology Colon and rectal surgery Dental/Oral surgery Dermatology Family medicine Gastroenterology General surgery Geriatric medicine Hematology Internal medicine Medical program, other Neonatal-perinatal medicine
Research space for veterinary medicine should be distributed among the appropriate fields of science (e.g., agricultural, medical, and biological).				

NSF field		NCES classification and additional examples of disciplines	
Physical sciences	Astronomy 40.02 Astronomy 40.03 Astrophysics	Additional examples: Gamma-ray Neutrino Optical and radio X-ray	
	Chemistry 40.05 Chemistry Additional examples: Analytical Inorganic Organic	Organo-metallic Pharmaceutical Physical Polymer sciences (except biochemistry—see Biological sciences)	
	Physics 40.08 Physics Additional examples: Acoustics Atomic/Molecular Chemical	Condensed matter Elementary particles Nuclear structure Optics Plasma Theoretical/mathematical	
	Other physical sciences 40.01 Physical sciences, general 40.0799 Miscellaneous physical sciences, other 40.99 Physical sciences, other	Additional examples: Multidisciplinary projects within physical sciences Other disciplines not listed separately above	
Psychology	42.01 Psychology, general 42.02 Clinical psychology 42.17 School psychology 51.2301 Art therapy	Additional examples: Animal behavior Educational Experimental Human development and personality Social	
Social sciences	Economics 01.0103 Agricultural economics 45.06 Economics 52.06 Business/Managerial economics Additional examples: Applied Development Econometrics	Industrial International Labor Public finance and fiscal policy Quantitative Resource	
	Political science 44.04 Public administration 44.05 Public policy analysis 44.99 Public administration and service, other 45.09 International relations and affairs 45.10 Political science and government	Additional examples: Comparative government Legal systems Political theory Regional studies	

NSF field		NCES classification and additional examples of disciplines	
		Sociology 45.02 Anthropology (social and cultural only) 45.05 Demography and population studies 45.11 Sociology	Additional examples: Comparative and historical Complex organizations Cultural and social structure Group interactions Social problems and welfare theory
		Other social sciences 04.03 City/Urban, community, and regional planning 05 Area and ethnic studies 16.0102 Linguistics 43.01 Criminal justice and corrections 44.02 Community services 45.01 Social sciences, general	45.03 Archaeology 45.07 Geography 45.12 Urban studies/affairs 45.99 Social sciences, other Additional examples: History of science Socioeconomic geography
Other sciences		Use this category when multidisciplinary, interdisciplinary, or other aspects make classification under one primary field impossible	
Animal subject government policies and regulations	space to and	Use this category for your institution’s animal space that is regulated by local, state, or federal government policies and regulations concerning humane care and use of animals. (laboratories and laboratory support, animal housing and housing support).	

Survey of Science and Engineering Research Facilities

Part 2: Computing and Networking Capacity

12/13/2002

National Science Foundation
National Institutes of Health

Please enter your identification number.

Identification Number

Your participation in this survey is voluntary. However, your institution's response is important because the information from this survey is used to provide a national, quantitative picture of the amount and condition of existing science and engineering research facilities at research-performing colleges, universities, and some biomedical research organizations.

Contact information

If you wish to comment on the burden of completing this survey, contact Suzanne H. Plimpton, Reports Clearance Officer, NSF, via email at splimpto@nsf.gov or call 703-306-1125.

Or, you may write the Office of Management and Budget, Paperwork Reduction Project (OMB Number 3145-0101), Washington, DC 20503.

If you have a question about the survey in general, please contact Dr. Leslie Christovich via e-mail at lchristo@nsf.gov or call 1-800-292-7782. If you have a question about a specific item in the survey, please contact xxxxxxxxxxxx at xxxxxxxx

Thank you for your participation.

General Instructions

Introduction

This section is a new addition to the National Science Foundation's (NSF) biennial Survey of Science and Engineering Research Facilities. The original survey requested information about physical research infrastructure at U.S. colleges and universities, including the amount of research space; repairs, renovation, and construction of research space; and sources of funding for repairs, renovation, and construction of research space.

NSF has added this new section on computing and networking as Part 2 of the Survey of Science and Engineering Research Facilities because of the essential role this has come to play in today's research. This section is separate from Part 1 of the survey because of the highly specialized information it requests.

Electronic questionnaire

This questionnaire is available on the World Wide Web. Go to www.nsf.gov/surf to access the web version of the questionnaire. You will need to enter a log-on ID and password: this is included in a label on the front of this paper questionnaire. Additional information about using the web version of the questionnaire is provided on a separate page accompanying this questionnaire.

Four components of your computer network

As you answer these questions, please do **not** consider access from student residence areas or from remote sites.

Commodity (Internet1) connections

- At the end of your FY 2002, how many of the following types of commodity (Internet1) connections did your institution have for Internet access? How many do you estimate you will have at the end of your FY 2003? Please do **not** report standard modems (57,600 bps or slower), ISDN, or DSL connections. (*Enter numbers; if none, enter "0."*)

Type of connection (speed)	Number of this type of external line	
	At end of FY 2002	Estimated at end of FY 2003
T1 or DS1 (1.5 megabits/sec.).....	<input type="text"/>	<input type="text"/>
T3 or DS3 (45 megabits/sec.).....	<input type="text"/>	<input type="text"/>
OC-3 (155 megabits/sec.).....	<input type="text"/>	<input type="text"/>
OC-12 (622 megabits/sec.).....	<input type="text"/>	<input type="text"/>
OC-48 (2.4 gigabits/sec.)	<input type="text"/>	<input type="text"/>
Other (<i>Please specify below.</i>).....	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>

Campus backbone

- Some institutions have a single campus backbone connecting all of their computers and workstations, while others have multiple segments that may operate at different speeds. At the end of your FY 2002, how many backbone segments operated at each of the speeds listed below? How many do you estimate will be at these speeds at the end of your FY 2003? (*Enter numbers; if none, enter "0."*)

The **backbone** of your institution's network connects the local area networks (LANs) to each other. Some segments of your institution's backbone may operate at different data transmission speeds from others, especially if your institution has multiple campuses.

Speed of connection	Number of backbone segments	
	At end of FY 2002	Estimated at end of FY 2003
10 megabits/sec. or less.....	<input type="text"/>	<input type="text"/>
100 megabits/sec.	<input type="text"/>	<input type="text"/>
1 gigabit or more/sec.	<input type="text"/>	<input type="text"/>
Other (<i>Please specify below.</i>).....	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>

Local area networks

3. Your institution may also have smaller local area networks (LANs) connected to each other through your campus backbone(s). At the end of your FY 2002, how many LANs operated at each of the speeds listed below? How many do you estimate will be at these speeds at the end of your FY 2003? *(Enter numbers; if none, enter "0.")*

A **local area network (LAN)** connects desktop computers over a relatively small area, such as a building or group of buildings.

Number of LANs connected to the backbones for your network		
Speed of LAN	At end of FY 2002	Estimated at end of FY 2003
10 megabits/sec. or less.....	<input type="text"/>	<input type="text"/>
100 megabits/sec.	<input type="text"/>	<input type="text"/>
1 gigabit or more/sec.	<input type="text"/>	<input type="text"/>
Other <i>(Please specify below.)</i>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>

Desktop ports

4. At the end of your FY 2002, what percentage of your institution's desktop ports had hardwire connections at each of the speeds listed below? What percentage do you estimate will be at these levels at the end of your FY 2003? *(Enter numbers; if none, enter "0.")*

Desktop ports connect individual PCs or workstations to your LAN or backbone. Please report on the ports themselves and not the speed of the workstations connected to them.

Percentage of desktop ports		
Speed of connection	At end of FY 2002	Estimated at end of FY 2003
10 megabits/sec. or less.....	<input type="text"/> %	<input type="text"/> %
100 megabits/sec.....	<input type="text"/> %	<input type="text"/> %
1 gigabit or more/sec.....	<input type="text"/> %	<input type="text"/> %
Other	<input type="text"/> %	<input type="text"/> %
<i>(Please specify:.)</i> <input type="text"/>	<input type="text"/>	<input type="text"/>
Total	100%	100%

5. With your current network configuration, what is the maximum speed that a desktop computer on your network could connect to another user **on your network**? For example, if your backbone speed is 100 megabits, but all desktop ports are at 10 megabits, then your maximum speed would be no greater than 10 megabits for a connection on your network. If some desktop ports are at 10 megabits but others are at 100 megabits, with a backbone speed of 100 megabits, then the maximum speed would be 100 megabits. (Enter number; if none, enter "0.")

megabits/sec.

6. Considering only your institution's current network and external connections, what is the maximum speed that a desktop computer on your network could connect to another institution **through a commodity (Internet1) connection**? For example, if your backbone speed is 100 megabits, but you have a T1 line for your Internet connection, then your maximum speed would be no greater than 1.5 megabits for an outside connection. (Enter number; if none, enter "0.")

megabits/sec.

7. What percentage of your desktop port connections can provide the maximum speed shown above for connections **through a commodity (Internet1) connection**? Please base your answer on the number of ports with such connections, not the percentage of authorized users. (Enter number; if none, enter "0.")

%

8. At the end of FY 2002, did your institution have an Internet2 connection?

Internet2 is a consortium of universities, industry, and government working to develop and deploy advanced network applications and technology. Members are connected through an advanced backbone network named Abilene. The consortium has regular members, corporate members, and affiliate members. Internet2 connections are also available to collaboration sites who collaborate with Internet2 university members.

(Mark one "X" below.)

Yes, we have an Internet2 connection ☐

No, we do not have an Internet2 connection ☐

Other (Please specify below.) ☐

9. Are the following included in a central, institution-wide document for planning your institution's information technology activities?

If your institution has no central document for institution-wide planning, please check this box and go to question 10.

☐

	Yes, institution plan includes this	No, but other plans include this (departmental, school, etc.)	No, not currently included in any plans
(Mark one "X" for each row.)			
a. Faculty training in the use of information technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Strategy for network replacement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Upgrades of personal computers on a regular schedule	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Upgrades of <i>operational</i> software on a regular schedule.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Upgrades of <i>application</i> software on a regular schedule.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- f. You may list any important activities below that are included in your planning for information technology.

10. For any single application, what is the highest computation rate currently available using only the computational capacity physically located within your institution? Include distributed/parallel computing if your institution has it configured to speed processing rates. Use decimals if needed (e.g., 500 megaflops is equal to 0.5 gigaflops).

GFLOPS (gigaflops) is a computing speed of 1 billion floating-point operations per second.

Computation rate refers to the number of operations a computer (or set of computers) can perform per second while working on a single application.

Highest computation rate available on your campus

(Enter number; if none, enter "0.") GFLOPS

11. Does your institution currently have the following ways to give users access to high computation rates?
(Mark one "X" for each row.)

	Yes	No
a. High performance computing on campus (Could include either a large-capacity mainframe computer or the use of parallel or distributed processing software to spread a single application over multiple computers. In either case the purpose would be to manipulate massive amounts of data in a very short time.)	<input type="checkbox"/>	<input type="checkbox"/>
b. Grid technology extending beyond your campus (The organized use of a wide area, multi-organizational pool of resources that is more powerful and more versatile than that of any single research node on the network. The resources provided might include increased computing speed, access to databases and/or scientific instruments, and specialized programs. The shared use of the resources requires specialized software — i.e., middleware.)	<input type="checkbox"/>	<input type="checkbox"/>

12. At the end of your FY 2002, what percentage, if any, of your institution's building area is covered by wireless capabilities for computer network access? What percentage do you estimate will have wireless access at the end of your FY 2003?

**Wireless capacity for
computer network access**

(Mark one "X" for each column.)

	At end of FY 2002	Estimated at end of FY 2003
None.....	<input type="checkbox"/>	<input type="checkbox"/>
10 percent or less	<input type="checkbox"/>	<input type="checkbox"/>
11 to 20 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
21 to 30 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
31 to 40 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
41 to 50 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
51 to 60 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
61 to 70 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
71 to 80 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
81 to 90 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
91 to 100 percent.....	<input type="checkbox"/>	<input type="checkbox"/>
Other (Please specify below.).....	<input type="checkbox"/>	<input type="checkbox"/>

13. What percentage of your institution’s building area with wireless coverage uses each of the following standards for wireless connections? Please note: If coverage overlaps, percentages may add to more than 100 percent. *(Enter numbers; if none, enter “0.”)*

Wireless standard (frequency, speed)	Percentage total area with this wireless coverage
a. 802.11a (5 GHz, 54 megabits/sec.)	<div></div> %
b. 802.11b (2.4 GHz,11 megabits/sec.).....	<div></div> %
c. 802.11g (2.4 GHz, 54 megabits/sec.)	<div></div> %
d. Other <i>(Please specify below.)</i>	<div></div> %
<div></div>	

14. Please add any comments below.